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[0011]

[Embodiment Mode of the Invention] Next, detailed explanation is given regarding embodiments of the invention, with reference to the diagrams. Fig. 1 is a block diagram showing a system configuration according to an embodiment of the present invention.

[0012] Referring to Fig. 1, a configuration of an embodiment of a computer trouble response automation system according to the present invention includes a user computer 10, a trouble analysis system 20, a parts management system 30, a maintenance personnel assignment system 40, a maintenance personnel's portable terminal 50, and a communication network 100 for connecting those components together.

[0013] The user computer 10 is an information processing device such as a personal computer or a work station. In a case where trouble occurs in the user computer, the user computer 10 automatically notifies trouble information including user ID information, the troubled computer's device ID information, a

trouble occurrence time, a trouble message and other such trouble detail information to the trouble analysis system 20 via the communications network 100.

[0014] The trouble analysis system 20 is an information processing device such as a server computer arranged at a computer maintenance company, and is a system storing a basic trouble analysis tool and past trouble case information, etc., capable of automatically analyzing the trouble information. The trouble analysis system 20 analyzes the user's trouble information sent from the user computer 10 via the communications network 100, and performs identification of a suspected faulty part which is necessary to resolve the trouble, and prepares a recovery work procedure. Information on the suspected faulty part thus identified and the like is automatically sent to the parts management system 30 via the communications network 100. Further, the user information, suspected faulty part information, etc. are also automatically sent to the maintenance personnel assignment system 40 via the communications network 100.

[0015] The parts management system 30 is arranged at a parts management center of a computer maintenance company, and conducts ordering of maintenance parts, inventory management, and the like. The parts management system 30 receives the suspected faulty part information and delivery instructions information in the user information sent from the trouble analysis system 20, and automatically performs preparation to deliver the suspected faulty

part designated by the delivery instruction information to the location where the troubled computer is arranged. Further, a planned arrival time and other such information relating to the delivery are sent to the maintenance assignment system 40.

[0016] The maintenance personnel assignment system 40 is arranged at the computer maintenance company, and manages such information as which computer each maintenance personnel are responsible for, the user information and a work status, current dispatch site information and the like. A corresponding maintenance personnel is automatically assigned based on the user's trouble information sent from the trouble analysis system 20. Information including trouble response instructions and the like is sent to the maintenance personnel's portable terminal carried by the thus assigned maintenance personnel.

[0017] The maintenance personnel's portable terminal 50 is an information processing device such as a personal computer which each maintenance personnel always carries around. The maintenance personnel follows the trouble response instructions sent from the maintenance personnel assignment system 40, to go to the user location where the troubled computer is arranged and fix the troubled computer.

[0018] Next, detailed explanation is given regarding operations of the computer trouble response automation system according to the present invention, with reference to Figs. 1 - 6. Fig. 2 is

a sequence diagram showing system operations according to an embodiment of the present invention, and Figs. 3, 4 and 5 are diagrams showing processing information of each block of the embodiment of the present invention. Fig. 6 is a diagram showing an example of content of the trouble response instructions displayed on the terminal carried by the corresponding maintenance personnel.

[0019] Further, Fig. 3 shows information transmitted to the trouble analysis system at the time of trouble at the user computer; Fig. 4(a) shows the information which the trouble analysis system 20 transmits to the parts management system upon receiving the user computer's trouble information; and Fig. 4(b) shows the information which the trouble analysis system 20 transmits to the parts management system upon receiving the trouble information from the user computer.

[0020] Further, Fig. 4(c) is a diagram showing how the parts management system executes preparation and delivery processing of the suspected faulty part based on the information from the trouble analysis system, and transmits the part's planned arrival time to the maintenance personnel assignment system; Fig. 5(a) is a diagram showing how the maintenance personnel assignment system executes selection of the corresponding maintenance personnel based on each type of information; and Fig. 5(b) is a diagram showing how the maintenance personnel assignment system executes display of the

trouble response instructions on a screen of the terminal carried by the corresponding maintenance personnel, based on each type of information.

[0021] Referring to Fig. 2, in a case where a trouble occurs at the user computer 10 or another computer owned by the user (step A1), the computer 10 automatically sends the information concerning the trouble at the computer where the trouble occurred to the trouble analysis system 20, via the communications network 100 (step A2). As shown in Fig. 3, the information that was automatically sent includes user ID information B1, the troubled computer's device ID B2, a trouble occurrence time B3, the trouble message and other such detailed information about the trouble B4, etc. At this time, the user computer where the trouble occurred and the user computer 10 do not have to be the same computer. In the case where they are not the same, the user computer where the trouble occurred must send the trouble information to the user computer 10.

[0022] The trouble analysis system 20 automatically analyses the information about the trouble that was sent from the user computer 10, and the identification of the suspected faulty part, which is necessary for recovery from the trouble, and preparation of the recovery work procedure, etc. are performed (step A3). The information prepared at this time includes, as shown in Fig. 4(a), a past trouble history B5 and a user location address and staff information B6 based on the user ID information B1 and the troubled

computer's device ID information B2; and, as shown in Fig. 4(b), the suspected faulty part information B7 identified based on the user ID information B1, the troubled computer's device ID information B2, the trouble occurrence time B3, and the trouble message and other detailed information about the trouble B4, and recovery work procedure B8. The user location address and staff information B6, and the suspected faulty part information B7, are sent to the parts management system 30 (Step A4). Next, the user ID information B1, the troubled computer's device ID information B2, the trouble occurrence time B3, the trouble message and other detailed information about the trouble B4, the past trouble history B5, the user location address and staff information B6, the suspected faulty part information B7, the recovery work procedure B8 and other such information are sent to the maintenance personnel assignment system 40 (step A5).

[0023] As shown in Fig. 4(c), according to the suspected faulty part information B7 and the user location address and staff information B6, the parts management system 30 performs part preparation B9 and part delivery instructions B10 for the troubled computer (step A6). Next, the part's planned arrival time B11 to the troubled computer is sent to the maintenance personnel assignment system 30 (step A7).

[0024] As shown in Fig. 5(a), the maintenance personnel assignment system 40 automatically assigns the corresponding maintenance

personnel B12 based on the ID information B1, the troubled computer's device ID information B2, the past trouble history B5, the user's location address and staff information B6, the suspected faulty part information B7, the recovery work procedure B8, the planned arrival time B11 and the like, which were sent from the trouble analysis system 20, and maintenance personnel information registered in the maintenance personnel assignment system (step A8). Trouble response instructions information B13, the user ID information B1, the troubled computer's device ID information B2, the trouble occurrence time B3, the trouble message and other detailed information about the trouble B4, the past trouble history information B5, the user location address and staff information B6, the suspected faulty part information B7, the recovery work procedure B8, and the part's planned arrival time B11 are sent to the maintenance personnel's portable terminal 50 of the corresponding maintenance personnel B12 who was assigned (Step A9, Fig. 5(b)). Based on the trouble response instructions information B13, etc. sent to the maintenance personnel's portable terminal 50, the maintenance personnel goes to the troubled computer's location (step A10). At this time, the screen information on the maintenance personnel's portable terminal 50 is shown in Fig. 6. [0025] A shown in Fig. 6, shown on the display screen of the maintenance personnel's portable terminal 50 are a user name, a troubled device name, the trouble occurrence time, the trouble

details, the user address, the staff in charge, the suspected faulty part, and the part's planned arrival time. Further, the trouble history, the recovery work procedure, the map, and the like are indicated as selection buttons, and detailed information can be shown by clicking on the selection buttons. In accordance with the recovery work procedure B8 in the information displayed with the trouble response instructions information B13, the corresponding maintenance personnel B12 performs repair of the troubled computer (step A11).

[0026] Next, explanation is given regarding a second embodiment of the present invention, with reference to Fig. 7. The second embodiment of the present invention is directed to the case where the user computer 10 does not have a function of making notification of the trouble automatically. In this case, since transmission cannot be sent automatically from the user computer 10 to the trouble analysis system 20 via the network. Thus, a difference from the first embodiment is that the communication therebetween is established through the intermediation of the user and a dispatcher responding for the user.

[0027] Therefore, in a case where a trouble occurs at the user computer (step C1), the user telephones the trouble status over to a response center and explains the trouble status (step C2). A dispatcher who received the explanation registers the user ID information B1, the troubled computer's device ID information B2,

the trouble occurrence time B3, and the troubled message and other trouble detail information B4 into the trouble analysis system 20 (Fig. 5, step C3). Processing after the trouble analysis system 20 is similar to the first embodiment, and explanation thereof is omitted.

[0028] Next, explanation is given regarding a storage medium storing a trouble response automation program according to the present invention, with reference to the diagrams. Fig. 8 is a networked computer system for executing the trouble response automation program.

[0029] Referring to Fig. 8, the configuration of the computer trouble response automation system of the present invention is constituted of: the user computer 10 including a personal computer or a work station; a server computer 60 arranged at the computer maintenance company and including a storage medium storing a trouble analysis program 640 and a medium storing a maintenance personnel assignment program 650; a parts management computer 70 including a medium storing a parts management program 710 and arranged at a parts management center of the computer maintenance company; a maintenance personnel's portable terminal 50; and a communications network 100 connecting those components to each other.

[0030] In the case where a trouble occurs at the user computer 10, the user computer 10 automatically sends the trouble information including the user ID information, the troubled computer's device

ID information, the trouble occurrence time, and the trouble message and other such trouble detail information to the server computer 60 via the communications network 100.

[0031] The server computer 60 executes the trouble analysis program 640, and by using the trouble information as input data, automatically analyzes the trouble information according to a database stored in the server computer 60 such as a basic trouble analysis tool 610, a user information 620, and a past trouble case information 630. The trouble analysis program 640 prepares the analysis results of the user trouble information sent from the user computer 10, performs identification of the suspected faulty part which is necessary for recovery from the trouble, and prepares the recovery work procedure. The information of the suspected faulty part thus identified and the like is sent automatically to the parts management computer 70 via the communications network 100. Further, the user information 620 and the suspected faulty part information are sent automatically to the maintenance personnel assignment program 650 as input data.

[0032] The parts management computer 70 performs ordering of the maintenance part and management of the inventory and the like, and executes the parts management program 710. By using the suspected faulty part information obtained by executing the trouble analysis program and the delivery instructions information from the user information as input data, the parts management computer 70

automatically performs preparation to deliver the suspected faulty part indicated by the delivery instructions information to the location where the troubled computer is arranged. Further, the planned arrival time and other information relating to the delivery are calculated.

[0033] The server computer 60 executes the maintenance personnel assignment program 650, and manages information regarding which computer each maintenance personnel is responsible for, the user information and work status, the current dispatch site information, etc. Based on the user's trouble information obtained as a result of executing the trouble analysis program, the corresponding maintenance personnel is automatically assigned. The trouble response instructions and other information are sent to the maintenance personnel's portable terminal 50 which the assigned maintenance personnel is carrying.

[0034] The maintenance personnel's portable terminal 50 is an information processing device such as a personal computer which each maintenance personnel always carries. The maintenance personnel follows the trouble response instructions obtained from executing the maintenance personnel assignment program and displayed on the maintenance personnel's portable terminal 50, to go to the user location where the troubled computer is arranged and fix the troubled computer.

[0035] Note that, the above-mentioned configuration of the computer

trouble response automation system explains an example, and restriction is not to be made to the above-mentioned system configuration.